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MOUNTAIN EAST/WEST AND NORTH/SOUTH

TRANSPORTATION CORRIDOR

REVISED TRAVEL FORECAST

1982

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1.0 INTRODUCTION

The evaluation of future road needs and alternative improvements to the transportation systems, as described in the Phase 1 and Phase 2 reports of the Mountain East/West and North/South Corridor Study were based on output of a travel demand model. The model, as described in Appendix A, forecasts future travel demand based on a projection of future land use, represented by projections of population and employment, and on measures of expected travel behaviour including: trip rates, trip lengths and choice between private and public modes of transportation. The model, as utilized in the previous phases of this study, made some assumptions concerning both future land use and future travel behaviour which appear optomistic in light of recent monitoring of growth and Regional Council action regarding the expansion of transit service in the Region.

Two major factors made it necessary to revise the travel demand forecasts used in the Mountain East/West and North/South Transportation Study. The first was the Hamilton-Wentworth Population Projections - 1981 Review produced by the Region's Planning and Development Department in September of 1981. The second was the decision of Regional Council on December 15, 1981 not to proceed with the implementation of an Intermediate Capacity Transit line linking the Hamilton Mountain to downtown Hamilton.

The report on Population Projections shows that the previous year 2001 population forecast of 550,000, adopted by Regional Council in February 1976, and used in the preparation of the Regional Official Plan, was no longer realistic. The report contains a new "most-likely" population forecast of 445,000 persons by the year 2001.

The revised population forecast also suggested that the assumptions on future modal split favouring a high transit use would be extremely difficult to achieve. Regional Council's decision not to proceed with an offer by the Province to implement an I.C.T.S. transit line, in the Hamilton Mountain to downtown corridor, removed any hope of implementing the previously assumed shift in personal preference toward transit.

The purpose of this report is to present the rationale for revising travel forecasts, the changes to the input of the travel demand model and the output of that revised modelling exercise as it affects the Mountain East/West and North/South Transportation Study.

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2.0 REVISED LAND USE INPUTS

2.1 Population Projections

The report "Hamilton-Wentworth Population Projections - 1981 Review" provided the basis for revising the projected land use inputs to the transportation forecast model. That report contains a range of projections for each municipality in the Region. The range is expressed as a high projection, a low projection and a "most-likely" projection as shown in Table No. 1 below.

TABLE 1

YEAR 2001
POPULATION PROJECTIONS BY AREA MUNICIPALITY
(Rounded to Nearest 500)

MUNICIPALITY	HIGH	LOW	'MOST-LIKELY'
Ancaster	40,500	27,000	31,500
Dundas	23,000	18,000	20,000
Flamborough	34,000	27,000	29,500
Glanbrook	10,000	8,000	9,000
Hamilton	313,000	294,000	302,000
Stoney Creek	58,000	48,500	53,000

The population projections were made utilizing a Cohort Survival Technique. The technique takes into account birth rate, death rate and migration rate and calculates changes in population on a year by year basis, by sex and by years of age. The "low" projection is based on a continuing decrease in the birth rate and a net annual out-migration of population from Hamilton-Wentworth. The "high" projection is based on an eventual reversal in the decreasing birth rate and a switch in migration to Hamilton-Wentworth. The "most-likely" projection is based on a continuation of a low brith rate with a minor annual in-migration into Hamilton-Wentworth on average.

The revised travel forecasts utilized the "most-likely" population projection since it would give an average measure of potential transportation impacts.

2.2 Population Allocation

The report on Population Projections provided a revised projection of future population growth by municipality within the Region. The travel forecast model requires input on future population by specific geographic units called "traffic zones" (see Map No. 1) which are similar in size to neighbourhoods. It was therefore necessary to allocate the future population to the specific traffic zones.

The methodology by which population was allocated to traffic zone is described in Appendix B. Since the population was projected by municipality, the allocation of population to traffic zone was done on a municipal basis. In the rural areas, population was allocated on the basis of existing dwelling units, designated settlement areas, limited severance potential and projected household loadings in terms of population per household. In existing development within urban areas, population was allocated on the basis of existing dwelling units, expected changes in the number of dwelling units and the expected loading in terms of population per household. In designated urban areas that are not now developed, population not allocated to existing developed areas was then allocated to proposed development areas on the basis of the planned staging of services.

Table No. 2 is a summary of the information on population from Appendix B by Macro Zone (The Macro Zones for the Region are shown on Map No. 2.). The table also shows population for previous years and the percentage change in population between those previous years and the projection.

Table No. 3 shows measures of dwelling units and the occupancy rates for each of the macro zones for the years 1971, 1976, 1980 and the projections for the year 2001. The table shows a past trend toward smaller household sizes, a trend that is projected to continue.

The fact that the population projection report does not show a growth in population in the City of Hamilton to the year 2001 does not mean that there will be no development in the City. The expected continuation of the trend in decreasing household size means that it will take more housing units to accommodate the same number of people. Calculations show that it will require approximately 18,000 more housing units than there were in 1981 to accommodate the 302,000 people projected to be residing in Hamilton in the year 2001. The majority of these new dwelling units will be developed on the Hamilton Mountain. Therefore, although the overall population in the City of Hamilton is projected to decrease slightly, there will be an increase of approximately 20,000 persons residing on the Hamilton Mountain and an equivalent decrease in the lower city.

TABLE 2

POPULATION BY MACRO ZONE FOR BASE YEARS & 2001 PROJECTION

MACRO ZONE	1981 POP'N	% CHANGE 1971-1976	1976 POP'N	% CHANGE 1976-1980	1980 POP'N	% CHANGE 1980-2001	2001 POP'N	% CHANGE 1971-2001
1	5,643	10	6,254	4	6,497	35	8,775	56
2	1,975	4	2,054	3	2,113	42	3,000	52
3	3,845	21	4,649	4	4,856	7	5,200	35
4	4,280	18	5,061	9	5,526	43	7,900	85
5	4,600	16	5,346	-3	5,192	-11	4,625	1
FLAMBOROUGH	20,343	15	23,364	4	24,184	22	29,500	45
6	1,430	-17	1,175	19	1,394	0	1,400	-2
7	15,865	14	18,037	0	18,113	3	18,600	17
DUNDAS	17,295	11	19,212	2	19,507	2	20,000	16
8	11,310	-9	10,281	3	10,596	163	27,900	147
9	3,855	1	3,899	-3	3,765	4	3,600	7
ANCASTER	15,165	-6	14,180	1	14,361	119	31,500	108
10	6,110	-4	5,840	-5	5,537	-10	5,000	-18
11	3,825	10	4,207	0	4,184	-4	4,000	5
GLANBROOK	9,935	1	10,047	-3	9,721	-7	9,000	-9
12	2,250	10	2,474	-17	2,051	12	2,300	2
13	1,850	37	2,537	125	5,704	180	16,000	765
14	5,795	-11	5,164	-6	4,844	110	10,200	76
15	17,475	15	20,191	15	23,278	5	24,500	40
STONEY CREEK	27,370	11	30,066	18	35,877	48	53,000	94

TABLE 2 (Cont'd)

POPULATION BY MACRO ZONE FOR BASE YEARS & 2001 PROJECTION

MACRO ZONE	1971 POP'N	% CHANGE 1971-1976	1976 POP'N	% CHANGE 1976-1980	1980 POP'N	% CHANGE 1980-2001	2001 POP'N	% CHANGE 1971-2001
16	18,685	8	20,279	-1	20,160	-7	18,750	0
17	12,822	35	17,289	-2	16,854	-14	14,500	13
18	27,310	-2	26,786	-2	26,269	8	28,400	4
19	7,355	-14	6,302	-11	5,610	-13	4,900	-33
20	11,325	-20	9,027	-13	7,854	-72	2,200	-81
21	55,755	-17	46,376	-7	43,289	-14	37,200	-33
22	49,085	-10	44,349	-7	40,986	-17	34,000	-31
23	14,625	111	30,904	8	33,371	-6	31,250	114
24	3,105	-33	2,078	-24	1,579	-100	0	-100
LOWER CITY	200,067	2	203,390	-4	195,972	-13	171,200	-14
25	22,205	26	27,981	3	28,716	-13	25,000	13
26	51,290	-10	45,877	-7	42,541	3	44,000	-14
27	21,975	4	22,901	-2	22,500	4	23,400	6
28	2,610	179	7,285	26	9,161	37	12,600	383
29	2,685	-3	2,095	35	2,821	602	19,800	637
30	840	265	3,070	67	5,135	117	6,000	614
MOUNTAIN	101,605	7	109,209	2	110,874	18	130,800	29
HAMILTON	301,672	4	312,599	-2	306,846	-2	302,000	0
REGION	391,780	4	409,768	0	410,496	8	445,000	14
31	13,919						17,450	25
32	73,125						152,550	109
BURLINGTON	87,044						170,000	95

TABLE 3

DWELLING UNIT AND OCCUPANCY FOR BASE YEARS & 2001

Macro Zone	1971		% Change in Units 1971-1976	1976		% Change in Units 1976-1980	1980		% Change in Units 1980-2001	2001	
	#Units	P.P.D.U.		#Units	P.P.D.U.		#Units	P.P.D.U.		#Units	P.P.D.U.
1				1782	3.5	9	1940	3.3	51	2925	3.0
2				595	3.5	8	634	3.3	55	1000	3.0
3				1294	3.6	9	1417	3.4	22	1733	3.0
4				1625	3.1	16	1891	2.9	55	2926	2.7
5				1506	3.5	4	1572	3.3	-2	1542	3.0
Flam.	6065*	3.8		6802	3.4	10	7463	3.2	36	10126	2.9
6				332	3.5	25	415	3.4	20	500	2.8
7				5734	3.1	8	6222	2.9	19	7440	2.5
Dund.	4925*	3.5		6066	3.2	9	6637	2.9	20	7940	2.5
8				2989	3.4	11	3318	3.2	200	9964	2.8
9				1088	3.6	4	1128	3.3	10	1241	2.9
Ancast.	4000	3.8	2	4077	3.5	9	4446	3.2	152	11205	2.8
10	1535	4.0		1622	3.6	3	1669	3.3	7	1785	2.8
11	980	3.9		1183	3.6	5	1237	3.4	11	1379	2.9
Glan.	2515	3.9	11	2805	3.6	4	2906	3.3	9	3164	2.8
12				678	3.7	1	683	3.4	9	742	3.1
13				737	3.4	111	1558	3.5	231	5162	3.1
14				1495	3.5	3	1540	3.1	155	3923	2.6
15				6540	3.1	20	7859	3.0	20	9423	2.6

TABLE 3 (Cont'd)

	1971		% Change in Units 1971-1976	1976		% Change in Units 1976-1980	1980		% Change in Units 1980-2001	2001	
	#Units	P.P.D.U.		#Units	P.P.D.U.		#Units	P.P.D.U.		#Units	P.P.D.U.
St. Crk.	7565	3.6	25	9450	3.2	23	11640	3.1	65	19250	2.7
16	6565	2.8	13	7431	2.7	1	7515	2.5	19	8928	2.1
17	6635	2.1	-5	6294	2.7	4	6581	2.6	5	6905	2.1
18	11185	2.4	23	13752	1.9	4	14340	1.8	32	18933	1.5
19	2050	3.6	-4	1960	3.2	-6	1832	3.1	-4	1750	2.8
20	2935	3.9	-8	2684	3.4	-7	2488	3.2	-68	786	2.8
21	19595	3.2	-14	16836	2.8	0	16812	2.6	1	16909	2.2
22	14740	3.3	4	15407	2.9	-1	15194	2.7	2	15454	2.2
23	4375	3.3	135	10303	3.0	13	11674	2.9	7	12500	2.5
24	820	3.8	-17	678	3.1	-19	549	2.9	-100	---	0
Lower Ham.	68900	3.1	9	75346	2.7	2	76985	2.5	-11	82165	2.1
25	6225	4.0	29	8061	3.5	10	8900	3.2	12	10000	2.5
26	13875	3.4	12	15559	2.9	0	15628	2.7	13	17600	2.5
27	8540	3.5	-17	7107	3.2	6	7548	3.0	29	9750	2.4
28	635	4.1	216	2012	3.6	27	2563	3.6	69	4345	2.9
29	450	3.9	35	606	3.5	45	881	3.2	675	6828	2.9
30	450	3.9	96	882	3.5	63	1439	3.6	44	2069	2.9
Ham. Mtn.	30175	3.6	13	34227	3.2	8	36959	3.0	37	50592	2.6
Ham.	99075	3.3	10	109573	2.8	4	113944	2.7	4	132757	2.3
Region	124145	3.1	12	138773	2.9	6	147036	2.8	16	184442	2.4

1971 - 2001 # of occupied units only; #units for 2001 calculated based on P.P.D.U. estimates.

*Significant change in Boundaries

1971 - Census, Statistics Canada
1976 & 1980 - Assessment
2001 - Planning & Development Dept. (June 1982 Projections)

2.3 Employment Projections

The travel forecast model utilizes two major indicators of future land use as input for forecasting future travel. The first is population which is an indicator of residential development. The second is employment which is an indicator of industrial, commercial, institutional, and office type development. The population projection developed in 1976 was accompanied by a projection of future employment and that employment projection was based to a large extent on labour force which was related to the projection of population. Since the population projection was modified, it was also necessary to revise the employment projections utilized in the travel forecast model.

The description of the methodology utilized in projecting employment in the year 2001 is contained in Appendix C along with the output from applying that methodology. The methodology projects labour force based on the "most-likely" population by applying labour participation rates developed for the 1976 projection. The overall Regional work force was then calculated by adding net commuting to the Hamilton-Wentworth labour force. The number of future employment opportunities were assumed to equal the projected available labour force. The total employment was then broken down into employment categories based on the base year make-up of employment and trends in the relative percentage of employment by category.

The projection of employment by category is contained in Table No. 4. The previous projection in 1976 showed 290,000 employees by the year 2001; the revised projection shows 228,000 employees by the year 2001.

TABLE NO. 4

2001 EMPLOYMENT PROJECTION BY CATEGORY

	Employees	Percent of Total
Manufacturing & Warehousing	100,200	44%
Retail	30,800	13.5%
Service	95,000	41.5%
Other	2,000	0.9%
TOTAL	228,000	100%

2.4 Employment Allocation

As in the case of population projections, the travel forecast model requires that the input of future employment by specific geographic units called traffic zones (see Map No.1). It was therefore, necessary to allocate the future employment projections to the specific traffic zones.

The procedure utilized to allocate employment to the traffic zone level and the projection by traffic zone are described in Appendix D. The employment projection was first allocated to the municipal level and then to the traffic zones within each municipality. The employment allocation was done by employment category and was based on the base year employment and distribution of growth to the designated growth areas (as reflected in the Regional Official Plan).

A summary of employment by Macro Zone (see Map No. 2) is shown in Table No. 5.

Overall employment is projected to increase by approximately 75,000 jobs between 1971 and the year 2001; the majority of that growth in job opportunities is expected to occur in the areas below the escarpment in Hamilton and Stoney Creek.

3.0 REVISIONS TO TRANSIT MODAL SPLIT

The travel forecast model uses transit modal split factors to calculate the number of forecasted trips that will be made on transit and the number of forecasted trips that will be made in private automobiles. The previous travel forecasts prepared for the Mountain East/West and North/South Corridor Study assumed a significant shift toward transit usage in the future based on a significant growth of population in the Hamilton urban area, an increase in residential densities within the urban area and the provision of a high speed exclusive right-of-way transit system operating between the Hamilton Mountain and the central area of the City. The revision in population projections shows that significant growth is unlikely, and there is little chance of achieving increased densities; the Council decision not to proceed with the I.C.T.S. line between the Mountain and the downtown area makes it extremely unlikely that any form of high speed transit will be implemented in the corridor within the forecast time horizon.

The original modal split factors were based on desired policy levels of transit use between different parts of the urban area. In light of changed circumstances, it was decided that a revised transit modal split should be developed based on reasonable and achievable increases in existing modal split. In order to achieve this, it is necessary to understand the base year modal split conditions.

TABLE 5

EMPLOYMENT BY MACRO ZONE FOR YEARS 1971 & 2001

MACRO ZONE	1971	% CHANGE 1971 - 2001	2001
1	750	-	750
2	487	-	487
3	618	-	618
4	877	224	2844
5	653	40	916
FLAMBOROUGH	3385	66	5615
6	462	20	554
7	4108	21	4984
DUNDAS	4570	21	5538
8	1327	334	5755
9	658	456	3660
ANCASTER	1985	374	9415
10	946	188	2730
11	574	1	580
GLANBROOK	1520	105	3310
12	318	1	322
13	126	430	669
14	1679	439	9053
15	4722	202	14278
STONEY CREEK	6645	252	24322
16	5815	25	7288
17	6163	16	7179
18	30132	66	49930
19	1891	18	2225
20	44870	4	46716
21	18314	6	19471
22	9709	7	10440
23	4402	85	8158
24	159	43	228
LOWER HAMILTON	121455	25	151635

TABLE 5 (Cont'd)

MACRO ZONE	1971	% CHANGE 1971 - 2001	2001
25	4571	54	7027
26	6524	87	12197
27	1442	32	1907
28	219	337	958
29	384	208	1182
30	303	1515	4894
HAMILTON MOUNTAIN	13443	109	28165
HAMILTON	134898	33	179800
REGION	153203	49	228000
31	3454	24	4298
32	17595	260	63402
BURLINGTON	21049	222	67700

3.1 Base Year Modal Split

A number of existing data bases were reviewed and an overview of the base year transit use and modal split conditions was prepared. The existing data sources on transit use included:

(a) A 24-hour transit trip table developed in 1972 from an on-board transit survey conducted by DeLeuw Lather Limited as part of a transit study conducted for the Hamilton Street Railway.

(b) 24-hour origin-destination tables for both transit trips and total person trips derived from the 1974 Home Interview Survey.

(c) A 1971 peak hour person trip origin-destination table constructed by the travel forecast model from input of 1971 land use data and travel characteristics from the 1974 Home Interview Survey.

(d) A 1980 origin-destination table of all persons utilizing transit between the Hamilton-Mountain and the lower city derived from an on-board transit survey conducted as part of the I.C.T.S. rapid transit study in 1980.

The above data sources were summarized in a matrix format representing the trip interchanges between the Macro Zones shown in Map No. 2. The data sources were compared with each other and to 1980 Hamilton Street Railway on-board ridership counts by route. Utilizing the above information, a modal split table was developed for the p.m. peak hour condition utilizing 1972 as a base year. The base year transit modal split factors are summarized in a matrix of interactions between major areas in the Region in Table No. 6. The numbers in each entry of the matrix are the comparative rate of transit to auto use for the trips between those zones. Zero means all trips use autos; 1.0 means all trips use transit.

3.2 Revised Modal Split Factors

Revised modal split factors were developed for the year 2001 forecasts based on the base year modal split factors and expected changes in these factors because of:

- overall increase in transit use due to increase in fuel costs and costs of autos;
- increases in transit use to specific areas due to changes in the magnitude and density of land uses; and
- increases in transit use between specific areas due to improved transit service between those areas.

TABLE 6

BASE YEAR MODAL SPLIT MEASURES

ORIGINS

DESTINATIONS

ORIGINS	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Other Internal (1-7)	.01	0	0	0	0	.01	.06	0	.05	.01	.03	.03	.02	0
2. Ancaster (8-9)	0	0	0	0	0	0	.02	0	.02	0	0	0	0	0
3. Glanbrook (10-11)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Upper Stoney Creek (12-13)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5. Lower Stoney Creek (14-15)	0	0	0	0	0	.01	.01	0	0	0	.01	0	.01	0
6. West Hamilton (16-17)	.01	0	0	0	.02	.13	.18	.07	.15	.09	.14	.15	.10	0
7. C.B.D. (18)	.06	01	0	0	.02	.18	.09	.15	.26	.20	.19	.24	.18	.01
8. Bayfront (19, 20, 24)	0	0	0	0	0	.06	.13	.03	.04	.06	.06	.09	.07	0
9. Central Hamilton (21)	.05	.01	0	0	.01	.15	.26	.06	.08	.16	.14	.17	.09	.03
10. East Hamilton (22-23)	.01	0	0	0	.01	.15	.20	.06	.15	.11	.08	.12	.12	0
11. West Mountain (25-28)	.04	0	0	0	.04	.10	.21	.06	.09	.29	.07	.11	.08	0
12. Central Mountain (26-29)	.04	0	0	0	0	.15	.24	.07	.16	.12	.10	.07	.09	0
13. East Mountain (27-30)	.01	0	0	0	0	.18	.18	.07	.09	.11	.08	.08	.04	0
14. Burlington (31-32)	0	0	0	0	0	0	.01	.02	.03	0	.01	0	0	0

A matrix of the expected year 2001 modal split factors was developed by modifying the base year matrix of modal split factors to reflect expected changes in the above factors. The matrix table of year 2001 modal split factors is summarized by major areas in Table No. 7.

In developing the year 2001 modal split table the following assumptions were made:

- There would be a general increase in transit use due to the rising cost of operating automobiles.
- Transit use increases due to increases in new development or density of development would occur mainly in the new developing zones.
- The transit service to the year 2001 will remain a surface bus transit system. Major increases in service will consist of some express service from outlying areas to the C.B.D. and Bay Front areas; bus priority measures where necessary to operate in congested corridors in the vicinity of the Hamilton downtown area; extension of routes into new development areas, utilization of new technology to provide information on bus scheduling etc. and increases in service between areas as demand warrants it.
- There will be some form of transit service between most rural areas and the downtown Hamilton area.

The revised modal split factors were then used as the basis of input to the travel forecast model. The model output of transit person trips was assigned to a representative transit network to get a measure of transit use by major corridors and screenlines. This assignment of transit trips was compared to base year passenger counts and previous transit trip forecasts.

4.0 REVISED TRAVEL FORECASTS

The revised land use projections and modal split factors were input into the travel forecast model to derive forecasts of future travel. The model calculates the flow of person trips, transit trips and vehicles between geographic areas in the Region. The model assigns the travel demand flows to networks representing the transit and road networks to obtain estimates of future demands on the road and transit systems. For ease of comparison, these travel demands are summarized by the screenlines described in Table No. 8.

The screenline summaries describe the traffic flows on the transportation route included in the screenline at the point where the routes cross the escarpment.

BLE 7

YEAR 2001 MODAL SPLIT PROJECTIONS

ORIGINS		DESTINATIONS													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	Other Internal (1-7)	.0	.05	0	0	.03	.06	.10	0	.10	.03	.05	.06	.04	.01
2.	Ancaster (8-9)	.03	.06	0	.06	.04	.08	.17	.08	.17	.08	.08	.07	.07	.03
3.	Glanbrook (10-11)	0	0	0	0	0	0	.05	.05	.05	0	0	.05	0	0
4.	Upper Stoney Creek (12-13)	0	.04	0	.10	.10	.08	.20	.10	.16	.10	.09	.09	.10	.02
5.	Lower Stoney Creek (14-15)	.01	.05	0	.10	.10	.08	.15	.06	.14	.14	.06	.07	.10	.04
6.	West Hamilton (16-17)	.06	.09	0	.09	.05	.25	.25	.10	.20	.13	.18	.22	.19	.05
7.	C.B.D. (18)	.10	.19	.05	.18	.16	.25	.13	.20	.40	.23	.28	.39	.28	.10
8.	Bayfront (19,20,24)	.03	.09	.05	.09	.07	.10	.20	.10	.10	.12	.12	.12	.10	.05
9.	Central Hamilton (21)	.10	.17	.05	.19	.17	.20	.40	.10	.15	.21	.19	.22	.19	.05
10.	East Hamilton (22-23)	.02	.10	0	.09	.08	.14	.24	.10	.19	.14	.13	.14	.15	.05
11.	West Mountain (25,28)	.06	.09	0	.08	.10	.19	.29	.12	.19	.12	.13	.15	.17	.07
12.	Central Mountain (26,29)	.05	.09	0	.09	.08	.24	.41	.11	.21	.15	.16	.10	.17	.05
13.	East Mountain (27,30)	.02	.11	0	.10	.10	.19	.28	.10	.18	.05	.13	.15	.12	.05
14.	Burlington (31-32)	.01	.04	0	.04	.02	.05	.10	.06	.09	.03	.05	.05	.04	0

TABLE NO. 8

DESCRIPTION OF ESCARPMENT SCREENLINES

Central Escarpment Screenline includes:

- Becketts Drive
- James Mountain Road
- Claremont Access
- Jolley Cut
- Sherman Access
- Kenilworth Access

West Escarpment Screenline includes:

- Highway #403
- Highway #2

East Escarpment Screenline includes:

- Red Hill Creek Freeway
- Mount Albrion Road
- Highway #20

Forecasts of vehicle trips were assinged to two different road networks:

(a) The No-Build Network represents the road system without the proposed Mountain East/West and North/South Transportation facility.

(b) The Build Network represents the road system with the proposed Mountain East/West and North/South Transportation facility.

The results of the travel forecasts are summarized in the following sections.

4.1 Person Trip Forecasts

Table No. 9 is a summary of the forecast of the P.M. peak hour, peak direction person trips crossing the escarpment by screenline and by area of origin and area of destination. The table also summarizes the 1971 person trip demand as calculated in the base year simulations.

The comparison between the 1971 data and the year 2001 forecasts show an increase in total person trip demand from approximately 14,000 to 32,000. The most significant increase are trips originating in the downtown Hamilton area with significant increases from East Hamilton and Stoney Creek. The increased trip projections are destined to all the developing areas on the Hamilton Mountain, Ancaster and Stoney Creek.

The person trip forecasts were assigned to screenlines on the basis of the No-Build road network. An evaluation of those assignments shows that most of the demand across the Central Screenline is from downtown Hamilton, central Hamilton, West Hamilton and the Bay Front but that there is some demand from Stoney Creek, Burlington and other areas. The East Screenline has mainly traffic from East Hamilton and Stoney Creek and the West Screenline has mainly external demand and demand from downtown Hamilton.

The traffic assigned to the Central Screenline is destined to all areas on the Hamilton Mountain with traffic on the Eastern Screenline going mainly to Stoney Creek and the central and east Hamilton Mountain. Nearly all the traffic assigned to the western screenline is either external traffic or destined to Ancaster.

TABLE 9

PERSONS CROSSING ESCARPMENT BY ORIGIN & DESTINATION (2001 & BASE YEAR)

(P.M. PEAK HOUR - PEAK DIRECTION)

ORIGINS & DESTINATIONS (MACRO ZONES)	YEAR 2001 (445,000 POPULATION) CENTRAL	SL	EAST	SL	WEST	SL	TOTAL ESCARPMENT	1971 BASE YEAR TOTAL ESCARPMENT
ORIGINS								
West Hamilton (16, 17)	1,620		5		970		2,595	1,490
Downtosn (18)	7,820		20		2,020		9,860	4,363
Bayfront (19, 20, 24)	3,610		870		700		5,180	3,282
Central Hamilton (21)	2.000		150		370		2,520	2,244
East Hamilton (22, 23)	1,670		2,310		210		4,190	1,584
Stoney Creek (15)	450		1,785		120		2,355	437
Other Internal (1-7)	690		10		370		1,070	448
Burlington (31, 32)	830		530		1,090		2,450	674
Other External (33, 37, 38)	140		60		1,830		2,030	0
TOTAL	18,830		5,740		7,680		32,250	14,522
DESTINATIONS								
West Mountain (25, 28)	5,470		380		20		5,870	2,956
Central Mountain (26, 29)	8,610		980		0		9,590	6,303
East Mountain (27, 30)	3,290		1,170		0		4,460	2,508
Ancaster (8, 9)	0		130		4,080		4,210	1,470
Glanbrook (10, 11)	450		620		80		1,150	896
Stoney Creek (12, 13)	620		1,960		0		2,580	389
Other Internal (7)	0		0		0		0	0
Haldimand-Norfolk (34)	390		400		940		1,730	0
Other External (35, 36)	0		100		2,560		2,660	0
TOTAL	18,830		5,740		7,680		32,250	14,522

4.2 Transit Trip Forecasts

Table No. 10 is a summary of the forecast of the P.M. peak hour, peak direction transit trips crossing the escarpment by screenline and by area of origin and area of desination. The table also summarizes the 1971 transit trip origins and destinations.

A comparison between the 1971 data and the forecast show a forecasted increase from approximately 1,900 to approximately 5,400 transit trips crossing the escarpment in the peak hour, peak direction. A general increase in transit demand is expected from all areas below the escarpment but the major concentration of origin will be in the downtown area. The forecast also calls for a significant increase in transit use from the Bay Front industrial area. The destinations of this increase in transit use is to all the developing areas above the escarpment.

The forecast of transit demand by screenline reflects the expectation that the majority of transit service will continue to cross the escarpment in the Central Screenline. Transit trips across the East Screenline will serve mainly the Stoney Creek and East Mountain and transit trips across the West Screenline will serve only Ancaster.

4.3 Vehicle Trip Forecasts

Vehicle trips were assigned to two different road networks; one representing the No-Build and the other representing the Build condition. Table No. 11 is a summary of the vehicle trips for the No-Build condition by area of origin and destination and by screenline.

The table shows approximately 19,900 vehicles crossing the escarpment in the P.M. peak hour, peak direction. The western screenline has mainly through traffic and trips to Ancaster, the eastern screenline has mainly trips to Stoney Creek and the Central and East Mountain. The rest of the traffic is assigned to the Central Screenline.

Table No. 12 shows the assignment of vehicle traffic to a Build network containing the Mountain East/West and North/South Roadway. There is a slight increase in traffic crossing the escarpment in the Build compared to the No-Build because of traffic diverted from minor mountain accesses in Stoney Creek. There is also a shift of traffic from the Central Screenline to the Eastern Screenline where the proposed facility would cross the escarpment. The traffic that would move from the Central to the East is traffic from the Bay Front, East Hamilton and Stoney Creek; and is desined to all developing areas on the Hamilton Mountain. The proposed facility would attract a small amount of traffic off the West Screenline, including some through traffic and some traffic destined to Ancaster.

TABLE 10

TRANSIT PERSONS CROSSING ESCARPMENT BY ORIGIN AND DESTINATION (2001 & BASE YEAR)

(P.M. PEAK HOUR - PEAK DIRECTION)

ORIGINS & DESTINATIONS (MACRO ZONES)	YEAR 2001 (445,000 POPULATION) CENTRAL	SL	EAST	SL	WEST	SL	TOTAL ESCARPMENT	1971 BASE YEAR TOTAL ESCARPMENT
ORIGINS								
West Hamilton (16, 17)	312		0		63		375	231
Downtown (18)	2,698		0		248		2,946	932
Bayfront (19, 20, 24)	580		100		43		723	180
Central Hamilton (21)	424		18		44		486	344
East Hamilton (22, 23)	342		100		20		462	177
Stoney Creek (15)	35		100		9		144	4
Other Internal (1-7)	118		0		80		190	17
Burlington (31, 32)	90		0		21		111	1
Other External (33, 37, 38)	0		0		0		0	0
TOTAL	4,599		318		528		5,445	1,886
DESTINATIONS								
West Mountain (25, 28)	1,317		50		0		1,292	517
Central Mountain (26, 29)	2,317		18		0		2,310	983
East Mountain (27, 30)	722		200		0		922	383
Ancaster (8, 9)	0		0		528		578	3
Glanbrook (10, 11)	11		0		0		11	0
Stoney Creek (12, 13)	232		100		0		332	0
Other Internal (7)	0		0		0		0	0
Haldimand-Norfolk (34)	0		0		0		0	0
Other External (35, 36)	0		0		0		0	0
TOTAL	4,599		318		528		5,445	1,886

TABLE 11

VEHICLES CROSSING ESCARPMENT BY ORIGIN AND DESTINATION (2001 NO BUILD)

(P.M. PEAK HOUR - PEAK DIRECTION)

ORIGINS & DESTINATIONS (MACRO ZONES)	YEAR 2001 (445,000 POPULATION) CENTRAL SL	EAST SL	WEST SL	TOTAL ESCARPMENT
ORIGINS				
West Hamilton (16, 17)	949	3	656	1,608
Downtown (18)	3,859	12	1,286	5,157
Bayfront (19, 20, 24)	2,197	559	477	3,233
Central Hamilton (21)	1,142	95	235	1,472
East Hamilton (22, 23)	968	1,595	138	2,701
Stoney Creek (15)	303	1,221	78	1,602
Other Internal (1-7)	275	9	211	495
Burlington (31, 32)	541	387	772	1,700
Other External (33, 37, 38)	102	46	1,329	1,477
TOTAL	10,336	3,927	5,182	19,445
DESTINATIONS				
West Mountain (25, 28)	3,010	241	13	3,264
Central Mountain (26, 27)	4,563	697	0	5,260
East Mountain (27, 30)	1,866	707	0	2,573
Ancaster (8, 9)	1	99	2,576	2,676
Glanbrook (10, 11)	321	450	55	826
Stoney Creek (12, 13)	286	1,352	0	1,638
Other Internal (7)	0	0	0	0
Haldimand-Norfolk (34)	287	303	683	1,273
Other External (35, 36)	2	78	1,855	1,935
TOTAL	10,336	3,927	5,182	19,445

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HAMILTON, ONTARIO

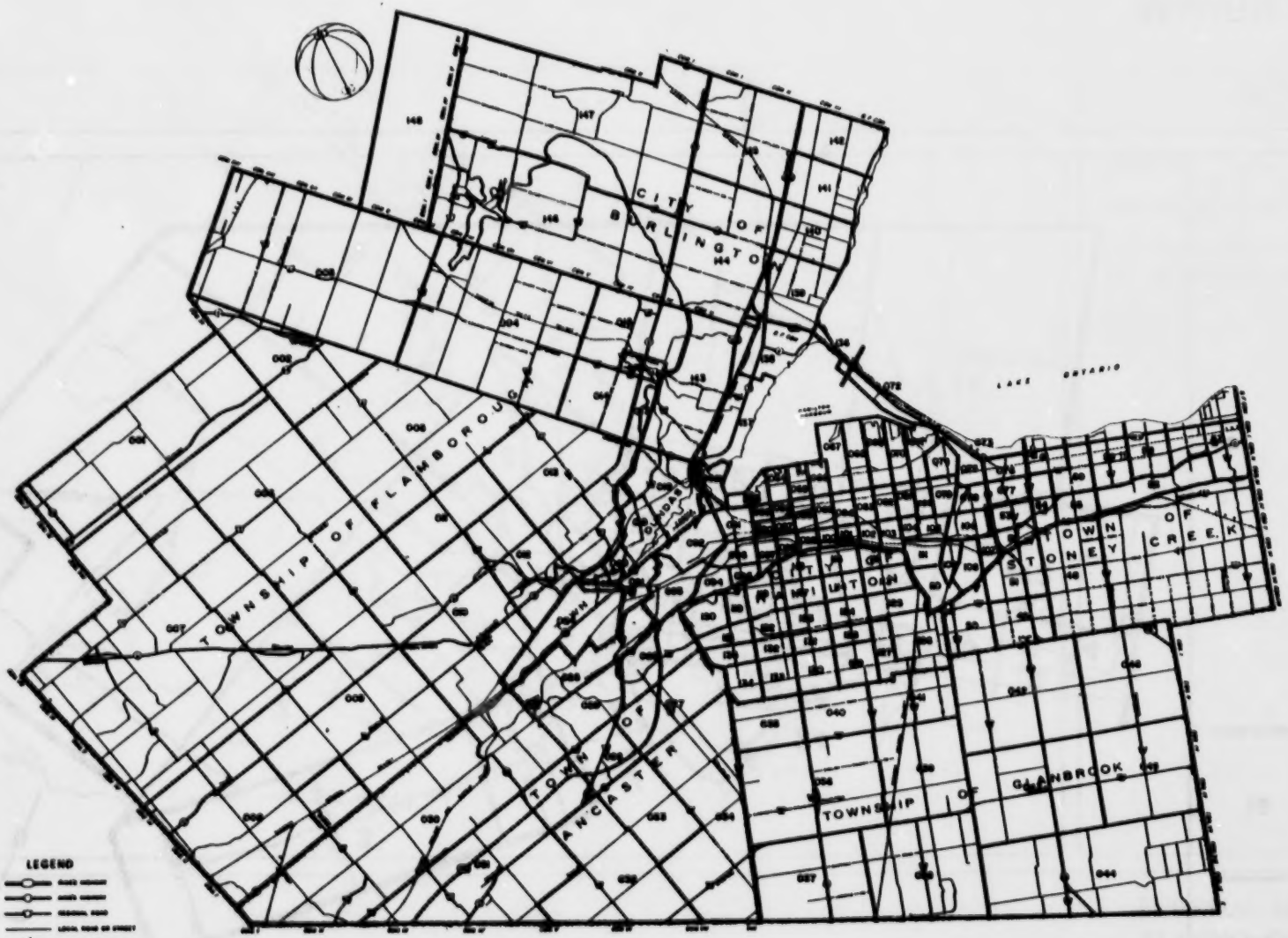
TABLE 12

VEHICLES CROSSING ESCARPMENT BY ORIGIN AND DESTINATION (2001 BUILD)

P.M. PEAK HOUR - PEAK DIRECTION

ORIGINS & DESTINATIONS (MACRO ZONES)	YEAR 2001 (445,000 POPULATION) CENTRAL	SL	EAST	SL	WEST	SL	TOTAL ESCARPMENT
ORIGINS							
West Hamilton (16, 17)	614		0		994		1,608
Downtown (18)	3,859		12		1,286		5,157
Bayfront (19, 20, 24)	1,920		891		422		3,233
Central Hamilton (21)	1,106		140		226		1,472
East Hamilton (22, 23)	479		2,172		50		2,701
Stoney Creek (15)	51		1,800		0		1,851
Other Internal (1-7)	275		8		211		494
Burlington (31, 32)	177		854		669		1,700
Other External (33, 37, 38)	31		280		1,166		1,477
TOTAL	8,512		6,157		5,024		19,693
DESTINATIONS							
West Mountain (25, 28)	2,440		575		249		3,264
Central Mountain (26, 29)	4,050		1,112		98		5,260
East Mountain (27, 30)	1,529		951		93		2,573
Ancaster (8, 9)	0		263		2,413		2,676
Glanbrook (10, 11)	261		483		82		826
Stoney Creek (12, 13)	232		1,599		55		1,886
Other Internal (7)	0		0		0		0
Haldimand-Norfolk (34)	0		645		628		1,273
Other External (35, 36)	0		529		1,406		1,935
TOTAL	8,512		6,157		5,024		19,693

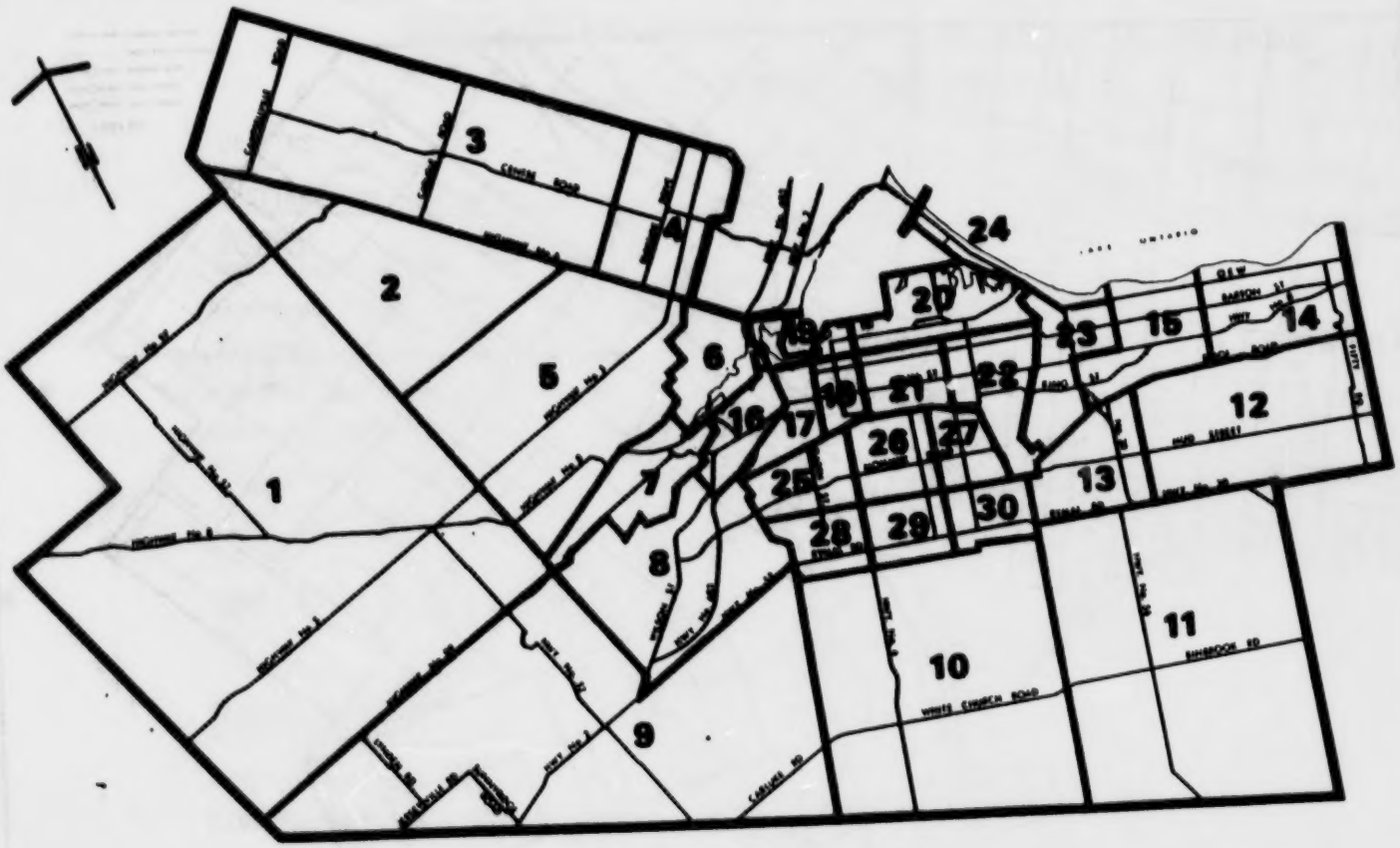
TRAFFIC ZONES



THE REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH
And The City of Burlington

PLANNING AND DEVELOPMENT DEPARTMENT

MAP NO. 1



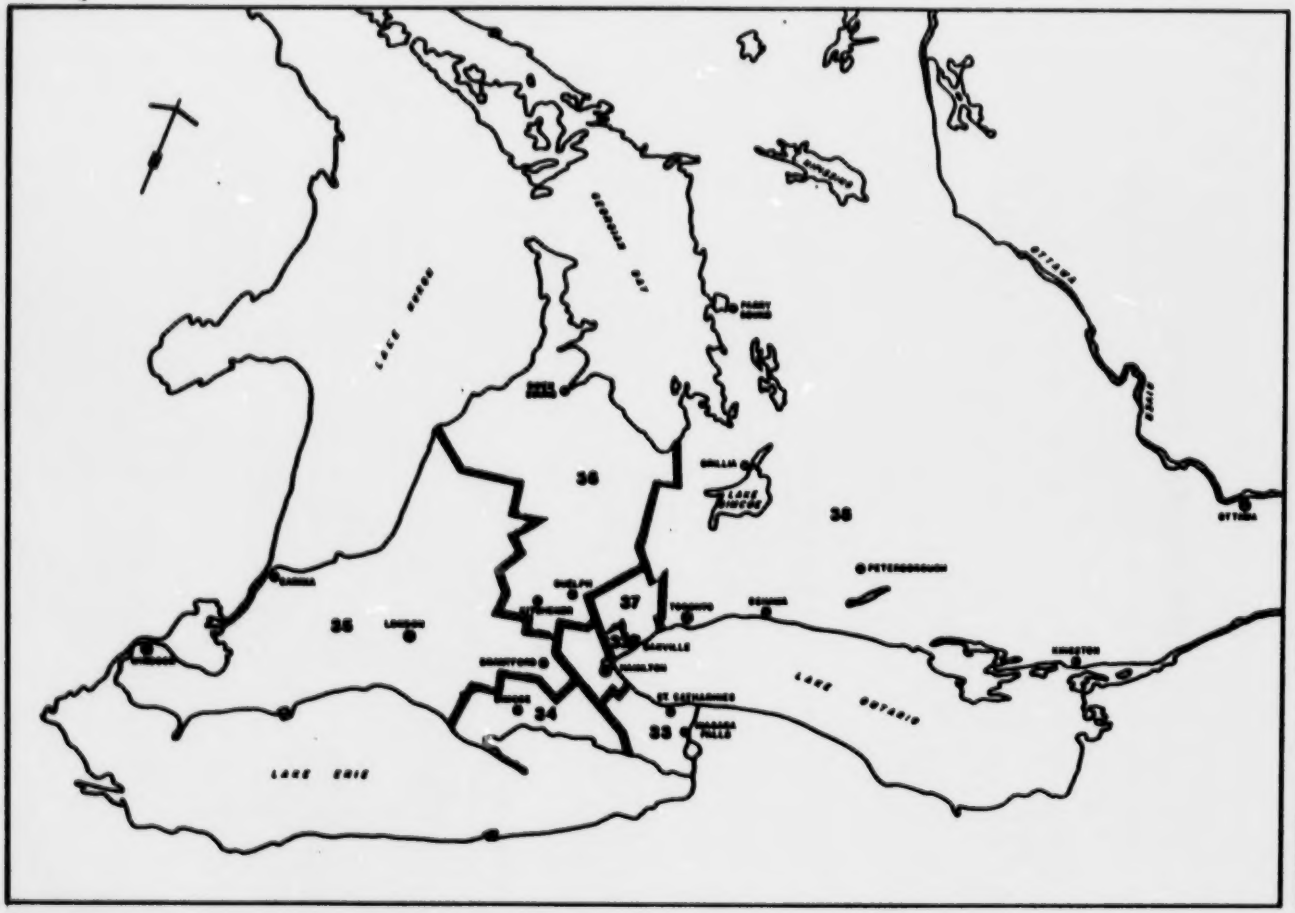
LEGEND

- ZONE BOUNDARIES
- 19 ZONE NUMBERS
- REGIONAL BOUNDARY

MAP NO. 2

MACRO ZONES

REGIONAL PLANNING DIVISION
PLANNING & DEVELOPMENT DEPARTMENT
HAMILTON-WENTWORTH REGION



MAP NO. 3

LEGEND

ZONAL BOUNDARIES

LOCATION OF INTERNAL MACRO TRAFFIC ZONES

EXTERNAL MACRO TRAFFIC ZONES

Nov. 1970

Planning & Development Department
Hamilton-Wentworth Region

APPENDIX A

THE TRAVEL FORECAST MODEL

FORECASTING TRAVEL

The Regional Travel Forecast Model was used to evaluate the need for the proposed road facility. The model was developed during the Regional Official Plan process in order to evaluate the transportation impacts of future land use development and possible modifications or additions to the Regional Transportation Systems such as the proposed facility.

THE MODEL

The purpose of the Regional Travel Forecast Model is to forecast future travel demands on the transportation systems in the Region resulting from proposed future development. The model requires input of measures of future development and outputs forecasts of traffic flows on the road and transit systems in the Region by specific routes or by corridors representing an aggregation of routes.

The Model is an analytical tool based on accepted research and practise by Transportation Planners throughout North America. It utilizes computer programs, developed and supplied by the Provincial Ministry of Transportation and Communications, which have been calibrated to represent conditions in Hamilton-Wentworth as measured in special surveys conducted in the Region. The model simulates P.M. peak hour demands of person trips, transit trips and vehicle flows.

The model is based on the accepted theories that:

(a) the amount of traffic on the transportation systems is a function of the amount of development and the rate of interaction between development;

(b) the share of traffic on either the road system or the transit system is a function of the comparable costs of utilizing the systems in terms of money, convenience and time, and the intensity of land use of both ends of the travel; and

(c) the choice of a specific route on a transportation system is based on minimizing the travel time and travel costs.

All of these theories are expressed as mathematical functions in the computer simulations of the transportation systems. The exact mathematical variables that are used in the simulation are dependent on the characteristics of the road and transit systems and the travel characteristics of the population in Hamilton-Wentworth. Defining the magnitude of the mathematical variables that best describe conditions in Hamilton-Wentworth is referred to as calibrating the model.

MODEL COMPONENTS

The Region's Travel Forecast Model is made up of two sub-models: an internal model which simulates traffic starting and ending in the Region or Burlington, and an external model that simulates traffic that either starts and/or ends outside the Region but has some part of the trip in the Region.

The internal model is a standard gravity model with the steps of trip generation, trip distribution, modal split and trip assignment. The trip generation step calculates the number of trips starting or ending at each traffic zone based on calibrated functions of land use (expressed in terms of population and employment). The trip distribution step calculates the number of trips between each pair of traffic zones based on a trip distribution formula calibrated to base year trip length measures. The modal split step calculates the number of trips between each pair of traffic zones that will travel by transit and the number that will travel by private automobile based on measures of modal split in the base year and expected changes in those modal split measures. The number of passenger vehicles travelling between traffic zones is calculated by dividing the number of persons travelling by auto by an auto occupancy factor. The trip assignment step assigns the vehicle trips between traffic zones to a computer simulation of the road network, representing either the existing road network or a road network with proposed improvements.

The external model calculates additional traffic travelling on the Regional road network that starts and/or ends outside the Region. The model is based on a 1976 origin-destination of all auto traffic crossing the Regional boundary. A base year origin-destination matrix of that traffic was constructed and future increases in the traffic are calculated by means of a fratar factoring technique that increases the vehicle volumes travelling between two zones based on the expected increase in land use activity in the two zones as measured by projected changes in the population and employment in the zones. The external traffic vehicle volumes are assigned to the same road network that the internal traffic volumes are assigned to.

Neither the internal nor the external models are capable of simulating truck loadings on the road network. In order to obtain a measure of future total vehicle volumes on the road network, it is necessary to factor up the simulated auto vehicle demand to represent total vehicles. The truck factors are measured percentages of truck volumes at defined screenlines in the Region. The latest measures of the percentage truck volumes at the screenlines was done in the 1981 Traffic Cordon Count done by the Region in 1981.

MODEL CALIBRATION

To calibrate the model, it was necessary to have measures of conditions in Hamilton-Wentworth. This information was obtained from a number of sources.

The nature and operating condition of the transportation systems were obtained from the Regional Engineering Department, the City of Hamilton Traffic Department and the Hamilton Street Railway. The information on the road system included data for major road links such as length, number of lanes, capacity, and peak hour operating speeds. The information on the transit system included length, headway, average travel speed, and average peak hour patronage for each bus route. This information was obtained for the year the model was calibrated and has been updated periodically since.

The main source of information on the travel behaviour of individuals and households in Hamilton-Wentworth was a TravellCharacteristics Survey conducted in 1974. This consisted of a telephone interview of one percent of all households in Hamilton-Wentworth and Burlington. It collected key data on the characteristics of the household, the individuals that formed the households, and the travel made by those individuals on a typical day. The information from the survey was summarized to obtain measures of trip generation for individuals, households, and labour force and the trip length distribution for different trip purposes. Also surveyed were the variation in choice between auto and transit mode relative to trip orientation, the characteristics of the traveller and the differences in travel time of the two modes.

The survey sample was tested to be sure it accurately represented the Hamilton-Wentworth population by comparing data summaries on household and population characteristics from the survey to similar summaries from the 1971 Canada Census data and testing for accuracy of fit.

The data from the 1974 Travel Characteristics Survey was supplemented from two other sources. Additional data on transit usage and the choice between auto and transit mode was obtained from an on-board Bus Passenger Survey conducted in November, 1972 by De Leuw Cather Limited Consultants for the Hamilton Street Railway. That survey provided a measure of the number of persons utilizing transit between different geographic areas. Data on traffic travelling into, out of, or through the Region was obtained from a roadside origin-destination survey conducted by the Region in 1976. That survey was used as the basis of calibrating a model to represent external traffic flows in the Region. In 1981, an Employee Travel Survey collected data on travel characteristics of persons employed in the Region. The survey collected data at the place of employment and supplemented previous data bases with information on trip rates, trip lengths and modal choice for work trips.

In 1980, an On-board transit survey collected data on the origin and destination and other travel characteristics of persons using transit between the Hamilton Mountain and the lower city. This survey was conducted as part of the I.C.T.S. rapid transit study.

MODEL VALIDATION

Before being used to forecast future travel conditions, the accuracy of the model was checked by comparing a simulation of base year conditions against actual measure of traffic conditions in the base year. The base year 1971 was used because of the accuracy of available data on land use measures from Census Canada and a comprehensive employment survey done that year by the City of Hamilton.

The validity checks included a comparison of measures of traffic flows on road and transit systems, by major corridors, between the simulation and observed counts. The 1971 traffic count data was provided by the Hamilton Street Railway, the City of Hamilton Traffic Department and the Provincial Ministry of Transportation and Communications. Additional checks were done by comparing the simulation of trips between different geographic areas with similar data collected in the 1971 Census Place of Work - Place of Residence survey.

Further validation checks are made by periodically monitoring traffic flows by major corridor. This monitoring program summarizes traffic data collected in surveys such as the 1981 Traffic Cordon Survey, and plots changes in traffic over time. Trends in traffic are compared with the model projections for the area to check for consistency.

APPENDIX B

ALLOCATING PROJECTED POPULATION

ASSUMPTIONS USED TO ALLOCATE PROJECTED POPULATIONS

METHODOLOGY

1. The Cohort-Survival Population projections for the area municipalities were the basis for each projection.

2. The projected area municipal population projections were allocated to planning divisions based on the number of dwelling units existing in the division, the expected increase in dwellings and a specific declining dwelling unit loading factor.

3. The projected populations of the planning divisions were then broken down into traffic zones based on the assumptions listed below.

ASSUMPTIONS

Ancaster

Rural Area - Area will contain the existing housing stock plus 5 severances a year for 21 years.

Urban Area - Area will contain the existing housing stock plus:

- T.Z.#26 (Traffic Zone) 75% of the vacant "old town" land will be developed at 6 units per acre @ 2.8 p.p.d.u. plus Allarco Neighbourhood #1.
- T.Z.#28 - 66% of the vacant "old town" land will be developed at 6 units per acre @ 2.8 p.p.d.u.
- T.Z.#27 (Includes Allarco Neighbourhoods #2, 3, 4 and 5). Total municipal population from cohort-survival minus other T.Z.'s.

Dundas

- The Niagara Escarpment Commission Areas will increase from 415 to 500 D.U.'s @ 2.8 p.p.d.u.
- T.Z.#20, 21, 22, 23 are presently fully developed.
- T.Z.#24 will contain the remainder of approximately 900 new d.u.'s.

Flamborough

Growth was based on the existing dwelling units plus additional growth allocated based on the following assumptions:

1. Rural severances and rural residential estate development was allocated on the basis of the size of the Planning Division.

2. Growth in the rural settlement areas were allocated to each Planning Division on the basis of the number of settlement areas located in each Planning Division.

3. Planning Divisions are broken down based on the ratio of T.Z.'s to P.D.'s used in the 1975 projections.

Glanbrook

Glanbrook's existing d.u.'s plus 4 units a year in P.D. #10 and 4 units a year in P.D. #11 at 2.8 and 2.9 p.p.d.u. respectively.

Hamilton

The following policy decisions apply to Hamilton:

1. No population was allocated to the "Residential Enclaves" (except for dwellings in the McNaulty and Keith Neighbourhoods) due to a policy decision.

2. No population was allocated to the Beach Strip due to a policy decision.

3. McMaster Univewrsity's resident population was added separately.

The following table shows the existing and projected housing stock and dwelling unit loadings in Hamilton's planning divisions. It should be noted that considerable new development will take place in Hamilton despite the decline in total population due to declining housing unit loadings.

Populations were broken down to the traffic zone level based on the existing and anticipated housing stock.

HAMILTON Population Allocation By Planning Division

Planning Division	Existing Dwellings and p.p.d.u. rate	Projected Dwellings and p.p.d.u. rate	Comment
61	1,832 @ 3.1	1,750 @ 2.8	
62	2,488 @ 3.2	1,500 @ 2.8	Residential enclaves
63	549 @ 2.9	0	Beach Strip - Cons. Auth.
64	11,674 @ 2.9	12,500 @ 2.5	Gershome Neigh.
65	15,194 @ 2.7	14,800 @ 2.3	
66	16,812 @ 2.6	16,900 @ 2.2	Assumes redevelopment
67	14,340 @ 1.8	18,900 @ 1.5	Substantial redevelopment
68	6,581 @ 2.6	6,900 @ 2.1	Assumes redevelopment
69	7,515 @ 2.5	7,800 @ 2.1	Assumes some new devop.
71	8,900 @ 3.2	10,000 @ 2.5	
72	15,628 @ 2.7	18,200 @ 2.5	
73	7,548 @ 3.0	9,800 @ 2.4	
74	1,439 @ 3.6	2,600 @ 2.9	
75	881 @ 3.2	5,900 @ 2.9	
76	2,563 @ 3.6	4,300 @ 2.9	
TOTAL	113,901 @ 2.7	131,850 @ 2.3	

Stoney Creek

Population allocations to Stoney Creek were based on:

1. The assumption that the lower town will continue to be a more attractive residential area than the upper town. Therefore, the lower town is to grow to 75% of its urban designated area with the remainder allocated to the upper town.

2. The high density lakeshore development in the lower town will grow at a slower rate than originally planned.

3. Winona and Fifty Point will have only a small amount of growth.

4. The upper town rural area will grow at a rate of one dwelling unit per year.

PROJECTED 2001 POPULATION BY TRAFFIC ZONE

	TRAFFIC ZONE	1975 PROJECTIONS	1981 PROJECTIONS
Ancaster			
	25	500	700
	26	5,200	5,200
	27	21,400	13,400
	28	4,200	5,400
	29	2,762	3,200
	30	1,400	1,200
	31	900	800
	32	500	475
	33	500	475
	34	700	650
	Total	38,000	31,500
Dundas			
	18	1,000	600
	19	1,500	800
	20	2,500	3,900
	21	4,500	2,750
	22	2,500	2,000
	23	2,500	2,000
	24	10,500	7,950
	Total	25,000	20,000

PROJECTED 2001 POPULATION BY TRAFFIC ZONE

Flamborough		
1	600	650
2	1,200	1,150
3	2,500	2,100
4	3,700	3,100
5	1,900	1,850
6	700	750
7	2,400	2,650
8	1,500	1,650
9	800	850
10	2,300	2,225
11	500	425
12	2,500	2,150
13	2,400	2,050
14	1,500	1,800
15	2,000	1,800
16	3,000	3,500
17	500	800
Total	30,000	29.500

Glanbrook

35	800	700
36	1,200	1,300
37	700	600
38	500	500
39	500	400
40	900	900
41	400	600
42	1,500	1,000
43	6,000	1,000
44	600	550
45	500	550
46	1,000	900
Total	14,600	9,000

Hamilton		
62	0	0
63	2,000	1,500
64	5,000	3,400
65	0	1,100
66	0	0
67	0	0
68	0	0
69	0	900
70	0	0
71	0	0
72	0	0
73	0	0
74	3,000	2,200
75	100	0
76	200	50
77	8,000	8,100
78	5,000	3,600
79	9,000	6,700
80	5,000	3,300
81	7,000	5,800
82	7,000	5,000
83	8,000	6,000
84	8,000	5,800
85	9,000	6,900

86	10,000	7,400	
87	3,000	2,900	
88	3,000	2,900	
89	3,000	2,500	
90	3,000	2,500	
91	8,500	6,900	
92	9,000	9,500	(includes McMaster)
93	11,000	9,250	
94	0	0	
95	3,500	2,200	
96	7,500	5,400	
97	12,000	10,700	
98	9,000	6,900	
99	5,500	3,600	
100	4,500	2,900	
101	3,500	2,600	
102	3,000	2,000	
103	5,000	4,000	
104	4,500	3,400	
105	4,000	2,000	
106	7,000	5,200	
107	3,000	3,000	
108	8,000	7,600	
109	4,500	3,700	
110	0	0	

111	5,400	3,800
112	7,000	5,500
113	11,000	9,000
114	8,000	5,300
115	11,500	10,500
116	8,500	7,400
117	7,500	6,600
118	7,500	5,400
119	3,500	2,500
120	6,000	5,200
121	5,000	6,500
122	7,000	5,400
123	8,000	8,200
124	8,000	6,000
125	8,500	8,900
126	0	0
127	5,500	6,000
128	6,000	6,000
129	8,000	2,400
130	7,200	2,400
131	6,000	5,000
132	3,300	2,500
133	1,200	900
134	500	1,200
135	5,500	8,000
Total	367,000	302,000*

(not including Zones 66 & 69)

Stoney Creek		
47	1,000	1,200
48	1,000	1,100
49	9,500	4,800
50	17,000	9,500
51	4,000	1,700
52	5,000	2,300
53	7,000	5,600
54	7,000	5,600
55	5,500	4,500
56	1,200	2,500
57	2,500	2,000
58	1,200	1,200
59	3,000	4,500
60	7,500	4,500
61	3,000	2,000
Total	75,400	53,000

APPENDIX C

EMPLOYMENT PROJECTIONS

Methodology - Region

1. A projection of the labour force participation rate by age and sex was made for the Region. This was based on the 1976 participation rate with increases in the female participation rate in the 20-24, 25-34, 35-44, and 45-54 age groups.

2. These participation rates were then applied to the "most likely" population projection for the Region based on the cohort survival technique as shown in the accompanying table. The total labour force projected using this method was 220,077.

3. An incoming commuter labour force to the Region was then calculated based on 1971 statistics. In 1971 6,155 more people residing outside of the Region commuted to work in Hamilton-Wentworth than residents of Hamilton-Wentworth working outside of the Region. The same ratio of commuters to total resident labour force that existed in 1971 was assumed to exist in 2001. This amounted to 8,361 which brought the total employment for the Region to 228,438.

HAMILTON-WENTWORTH LABOUR FORCE - 2001

AGE GROUP		REGIONAL 2001 'MOST-LIKELY' POPULATION	MAY 1976 HAMILTON CMA PART. RATE	PROJECTION 2001 PART. RATE	TOTAL LABOUR FORCE
15 - 19	M	15,948	49.2	"	7,846
	F	15,244	44.8	"	6,829
20 - 24	M	14,018	87.6	"	12,280
	F	13,490	67.9	73.0%	9,848
25 - 34	M	30,134	92.7	"	27,934
	F	29,429	52.0	63%	15,303
35 - 44	M	38,698	93.2	"	36,067
	F	38,575	54.1	60%	20,869
45 - 54	M	31,284	92.2	"	28,844
	F	33,406	49.6	55%	16,567
55 - 64	M	20,181	80.5	"	16,246
	F	22,002	34.8	"	7,970
65+	M	24,495	17.3	"	4,238
	F	37,592	5.1	"	1,917
					220,077

4. This figure was checked using an alternative methodology. A regression analysis was made of the growth rate of the Hamilton C.M.A. over the past 10 years. The projection gave a 2001 projection of 253,000 for the C.M.A. which would probably mean that Hamilton-Wentworth would have a lower total employment than the 228,000 forecasted using the other methodology. The previous methodology was chosen because it was assumed that the employment growth rate would increase in the future.

5. The total projected employment for the Region was broken down to employment categories based on modifications of the ratios used in the previous (1975) projections, as shown in the accompanying table and graphs.

   The rate of the shift from employment in the manufacturing and warehousing sector to the service sector is not as pronounced as it was in the previous projections. This lower rate of change is more reasonably given past trends and Hamilton's likely future role in attracting "head office or Regional office" functions.

   By 2001, "Other" employment which includes agricultural and other primary industries will decline slightly to 2,000 from 2,103 in 1971.

   "Retail employment will grow to 30,800 from 20,253 in 1971, due to new retail projects that have already been constructed since 1971 such as Jackson Square, Eastgate Square, Lime Ridge Mall and the Centre Mall expansion. This growth will be augmented by other new commercial developments in the future, particularly in the Allarco development and in Heritage Green.

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2001 EMPLOYMENT BY CATEGORY

	1975 Projections for 2001		1981 Projections for 2001	
Manufacturing and Warehousing	113,094	(39%)	100,100	(44%)
Retail	31,943	(11%)	30,800	(13.5%)
Service	142,347	(49%)	95,000	(41.5%)
Other	2,616	(1%)	2,000	(0.9%)
Total	290,000		228,000	

6. The total employment by sector was then allocated to the area municipalities based on the 1971 existing levels and the previous projections. The new projections of employment by municipality and employment sector were based on modifications to the previous figures using the criteria listed below. The accompanying tables show the 1971 existing levels, the previous projections and the new projections by municipality and employment sector.

(a) Manufacturing and Warehousing

The new projections are based on scaled down figures of the previous projections with a few exceptions:

- Ancaster's proportion drops slightly due to an expected delay in the extension of Highway #403 resulting in the delayed growth of Duff's Corners Industrial-Business Park.

- Dundas gains slightly to reflect probable existing employment levels.

- Glanbrook's proportion drops due to the anticipated slow growth of their new Industrial-Business Park.

- Stoney Creek and Hamilton slightly improve their share, although in the case of Hamilton, this is more a reflection of existing industries than in new growth.

(b) Retail Employment

The new projections are based on existing post 1971 retail centres and the location of new centres built since 1971 as well as anticipated new centres. In the new projections:

- Ancaster's proportion is higher due to new existing developments on Wilson Street as well as the anticipated Allarco community level shopping centre.

- Dundas, Flamborough and Hamilton have slightly declining shares.

- Stoney Creek and Glanbrook retain their share.

(c) Service Employment

In general, service employment has been allocated in the same proportions as the previous projections. A slight re-allocation of service employment was made to raise Ancaster's and Flamborough's proportions (due to expected growth in the Industrial-Business Park's area) and corresponding losses in Stoney Creek and Glanbrook.

(d) Other Employment

The other employment category consists mostly of agriculture which is assumed to have decreased in the areas where urbanization is the greatest as per the following schedule:

Ancaster	-	10% of loss
Dundas	-	7% of loss
Flamborough	-	10% of loss
Glanbrook	-	No change
Hamilton	-	33% of loss
Stoney Creek	-	43% of loss

EMPLOYMENT ALLOCATIONS TO MUNICIPALITIES

Manufacturing and Warehousing Employment

	1971 Existing		Previous (1975) 2001 Projections		New 2001 Projections	
Ancaster	49	0.06%	7,577	12.4%	5,100	5.1%
Dundas	2,110	2.9%	2,360	2.1%	2,500	2.5%
Flamborough	549	0.7%	2,130	1.9%	2,000	2.0%
Glanbrook	131	0.29%	4,090	3.6%	1,600	1.6%
Hamilton	66,280	90.4%	82,927	73.3%	75,000	75.0%
Stoney Creek	4,233	7.5%	14,010	12.4%	14,000	14.0%
REGION	73,352		113,094		100,200	

Retail Employment

	1971 Existing		Previous (1975) 2001 Projections		New 2001 Projections	
Ancaster	276	1.4%	627	2.0%	1,200	3.7%
Dundas	857	4.2%	1,124	3.5%	1,000	3.1%
Flamborough	651	3.2%	916	2.9%	800	2.4%
Glanbrook	314	1.6%	590	1.8%	400	1.8%
Hamilton	17,593	8.7%	25,553	80.0%	24,400	75.7%
Stoney Creek	562	2.8%	3,145	9.8%	3,000	9.3%
REGION	20,253		31,943		30,800	

Service Employment

	1971 Existing		Previous (1975) 2001 Projections		New 2001 Projections	
Ancaster	1,235	2.1%	3,371	2.4%	2,700	2.8%
Dundas	1,508	2.6%	3,010	2.1%	1,950	2.1%
Flamborough	1,397	2.4%	2,179	1.5%	2,000	2.1%
Glanbrook	715	1.2%	1,790	1.3%	950	1.0%
Hamilton	50,993	88.6%	120,420	84.6%	80,400	84.6%
Stoney Creek	1,685	2.9%	11,565	8.1%	7,000	7.4%
REGION	57,533		142,347		95,000	

Other Employment

	1971 Existing		Previous (1975) 2001 Projections		New 2001 Projections	
Ancaster	425	20.2%	425	16.2%	415	20.8%
Dundas	95	4.5%	106	4.1%	88	4.4%
Flamborough	825	3.9%	1,275	48.7%	815	40.8%
Glanbrook	360	17.1%	530	20.3%	360	18.0%
Hamilton	33	1.6%	0	0%	0	0%
Stoney Creek	365	17.4%	280	10.7%	322	16.1%
REGION	2,103		2,616		2,000	

EMPLOYMENT BY SECTOR AND MUNICIPALITY

MUNICIPALITY	MANUFACTURING & WAREHOUSING	RETAIL	SERVICE	OTHER	TOTAL
Ancaster	5,100	1,200	2,700	415	9,415
Dundas	2,500	1,000	1,950	88	5,538
Flamborough	2,000	800	2,000	815	5,615
Glanbrook	1,600	400	950	360	3,310
Hamilton	75,000	24,400	80,400	0	179,800
Stoney Creek	14,000	3,000	7,000	322	24,322
REGION	100,200	30,800	95,000	2,000	228,000

APPENDIX D

ALLOCATION OF PROJECTED EMPLOYMENT

METHOD ALLOCATING 2001 EMPLOYMENT
MICRO TRAFFIC ZONES

FLAMBOROUGH

Other - Keep same as 1971 except decrease traffic zone 14,15

Retail - Keep all zones the same as 1971
- Except the increase add to Traffic Zone 16

M & W - Keep all Zones the same as 1971
- Except Traffic Zone 14, 13, 17
- Add 75% of increase to Zone 14
  15% " " " " 13
  10% " " " " 17

Service - Keep all zones the same as 1971
- Except Traffic Zone 16, 14, 17, 13
- Add 50% of increase to zone 16
  30% " " " " 14
  10% " " " " 17
  10% " " " " 13

DUNDAS

Other - Keep all same as 1971
- Except Traffic Zone 23 which decreases

M & W - Keep in same proportion as 1971
Retail - " " " " " "
Service - " " " " " "

ANCASTER

Other
- keep all zones same as 1971 but decrease traffic zone 25, 26.
- All other employer types

  calculate in same proportions as 2001 data in previous projections.

GLANBROOK

Other
- keep all zones same as 1971

Retail
- same as 1971
- except Traffic Zone 36, and 43
- add 80% of increase to zone 36
- 20% of increase to zone 43

All other employment types
- calculate in same proportions as 2001 data.

STONEY CREEK

M & W
- same proportion as 2001 data but adjust Traffic Zone 58, 59, 60 and 61.

Retail
- take 1971 data and

  increase Traffic Zone 53 by 40% of increase for 2001*
- the 60% remaining is divided between Traffic Zone 54,52,50, and 60.

  54 - 30 %

  52 - 20 %

  50 - 40 %

  60 - 10 %

Service
- same as 1971 data
- except Traffic Zone 52,53, 53
- they get 40% of the increase
  60% of increase goes to the industrial areas, in the same proportion as industrial employment.

Other
- keep all zones same as 1971 except decrease traffic zones 52 - 55.

HAMILTON

Retail - estimated based on expected increases since 1971

- Traffic Zone 124 - 2300 employees
  78 - 1900 employees
  82 - same as 2001
  87 - same as 2001
  90 - 4,000
  117 - 1,500
- the other zones are given the remaining jobs in an update of the previous projections.

Service - Traffic Zones 82, 77, 90, 87, 123, 117 stay the same as 2001

- the remaining is allocated to the others in the same proportion as 2001.

Other - none.

M & W - 63-71, 74-76, 93-96, stay same as 1971

- remainder is allocated to the others in the same proportion as 2001.

2001 EMPLOYMENT BY TRAFFIC ZONES

	T.Z.	M & W	RETAIL	SERVICE	OTHER	TOTAL
FLAMBOROUGH		2000	800	2000	815	5615
	1	12	1	8	50	71
	2	24	55	119	7	205
	3	0	21	74	73	168
	4	47	97	168	138	450
	5	23	52	112	95	282
	6	0	2	5	31	38
	7	8	46	129	100	283
	8	26	16	33	58	133
	9	61	16	66	44	187
	10	12	1	3	22	38
	11	27	5	66	18	116
	12	88	49	204	26	367
	13	223	12	99	99	433
	14	1113	99	298	27	1537
	15	0	12	20	21	53
	16	187	290	497	0	974
	17	149	26	99	6	280

2001 EMPLOYMENT BY TRAFFIC ZONES

	T.Z.	M & W	RETAIL	SERVICE	OTHER	TOTAL
DUNDAS		2,500	1,000	1,950	88	5,538
	18	191	13	296	20	520
	19	-	0	24	10	34
	20	-	40	252	0	292
	21	22	376	226	0	624
	22	442	272	640	0	1,354
	23	630	28	384	38	1,080
	24	1,215	271	128	20	1,634
ANCASTER		5,100	1,200	2,700	415	9,415
	25	-	10	73	5	88
	26	1,764	530	1,171	[illegible]	3,465
	27	512	75	376	10	973
	28	45	300	701	35	1,081
	29	-	50	88	10	148
	30	-	29	82	105	216
	31	739	75	82	125	1,021
	32	2,000	108	82	30	2,220
	33	34	13	40	30	117
	34	6	10	5	65	86

2001 EMPLOYMENT BY TRAFFIC ZONES

	T.Z.	M & W	RETAIL	SERVICE	OTHER	TOTAL
GLANBROOK		1,600	400	950	360	3,310
	35	-	8	30	9	47
	36	-	100	570	68	738
	37	-	10	9	23	42
	38	-	2	7	37	46
	39	-	5	38	28	71
	40	75	20	38	17	150
	41	1,418	100	90	28	1,636
	42	35	30	11	28	104
	43	67	100	85	38	290
	44	-	-	27	19	46
	45	5	4	23	32	64
	46	-	21	22	33	76

2001 EMPLOYMENT BY TRAFFIC ZONES

	T.Z.	M & W	RETAIL	SERVICE	OTHER	TOTAL
STONEY CREEK		14,000	3,000	7,000	322	24,322
	47	80	15	17	100	212
	48	5	15	60	30	110
	49	30	15	18	5	68
	50	60	450	18	7	535
	51	5	40	11	10	66
	52	90	300	739	10	1,139
	53	180	1500	923	-	2,603
	54	20	200	770	10	1,000
	55	270	35	82	10	397
	56	730	30	42	25	827
	57	830	50	730	35	1,645
	58	2425	25	685	15	3,150
	59	2425	75	896	35	3,431
	60	2925	100	829	25	3,879
	61	3925	150	1180	5	5,260

2001 EMPLOYMENT TRAFFIC ZONES

	T.Z.	M & W	RETAIL	SERVICE	OTHER	TOTAL
HAMILTON		75,000	24,400	80,400	-	179,800
	62	-	-	25	-	25
	63	100	50	400	-	550
	64	800	50	800	-	1,650
	65	3,100	-	200	-	3,300
	66	2,200	-	200	-	2,400
	67	19,500	-	300	-	19,800
	68	4,500	-	75	-	4,575
	69	6,000	-	400	-	6,40(
	70	5,100	-	325	-	5,425
	71	2,600	-	200	-	2,800
	72	43	25	100	-	168
	73	-	-	60	-	60
	74	1,216	100	700	-	2,016
	75	524	100	400	-	1,024
	76	1,470	-	300	-	1,770
	77	52	600	300	-	952
	78	52	1,900	300	-	2,252
	79	761	150	800	-	1,711
	80	717	250	650	-	1,617
	81	411	150	600	-	1,161
	82	411	2,975	1,400	-	4,78(

2001 EMPLOYMENT BY TRAFFIC ZONES

T.Z.	M & W	RETAIL	SERVICE	OTHER	TOTAL
HAMILTON CONT'D					
83	1654	400	950	-	3004
84	2118	300	950	-	3368
85	2472	300	2300	-	5072
86	713	300	3600	-	4613
87	413	1500	8000	-	9913
88	3706	300	1500	-	5506
89	1031	100	1000	-	2131
90	1031	2500	13215	-	16746
91	1465	200	900	-	2565
92	187	350	5000	-	5537
93	601	150	1000	-	1751
94	158	25	15	-	198
95	-	25	100	-	125
96	3091	200	1000	-	4291
97	103	200	5000	-	5303
98	1031	300	9000	-	10331
99	-	100	900	-	1000
100	-	100	700	-	800
101	514	100	800	-	1414
102	-	50	150	-	200

2001 EMPLOYMENT BY TRAFFIC ZONES

	T.Z.	M & W	RETAIL	SERVICE	OTHER	TOTAL
HAMILTON CONT'D						
	103	-	50	250	-	300
	104	-	150	175	-	325
	105	-	50	350	-	400
	106	53	900	500	-	1453
	107	-	50	25	-	65
	108	257	50	75	-	382
	109	-	50	200	-	250
	110	-	-	40	-	40
	111	-	50	50	-	100
	112	31	500	400	-	931
	113	39	200	300	-	539
	114	41	400	650	-	1091
	115	51	250	2700	-	3001
	116	51	300	650	-	1001
	117	51	1475	600	-	2126
	118	51	250	2500	-	2801
	119	39	250	120	-	409
	120	39	50	1100	-	1189
	121	39	1400	500	-	1939
	122	39	150	500	-	689
	123	228	800	650	-	1678

2001 EMPLOYMENT BY TRAFFIC ZONES

T.Z.	M & W	RETAIL	SERVICE	OTHER	TOTAL
HAMILTON CONT'D					
124	-	2300	1000	-	3300
125	37	100	300	-	437
126	3426	50	500	-	3976
127	518	200	200	-	918
128	-	100	100	-	200
129	23	15	200	-	238
130	23	15	200	-	238
131	56	150	300	-	506
132	10	100	300	-	410
133	14	100	200	-	314
134	29	25	50	-	104
135	10	20	100	-	130

POOR

QUALITY

ORIGINAL